

**CONSERVATION AGREEMENT
AND STRATEGY FOR THE
ALABAMA STURGEON
*Scaphirhynchus suttkusi***

February 8, 2000

**CONSERVATION AGREEMENT
FOR THE ALABAMA STURGEON**
Scaphirhynchus suttkusi

I. INTRODUCTION

This Conservation Agreement for the Alabama Sturgeon, *Scaphirhynchus suttkusi*, (“Agreement”) has been developed as a collaborative and cooperative effort among state and federal resource agencies and the private sector in order to expedite the implementation of conservation measures needed to ensure the continued existence and recovery of the Alabama Sturgeon. These conservation measures will be implemented in accordance with the Endangered Species Act of 1973, as amended, 16 USC § 1531 *et. seq.* (“ESA”). The goal and objectives of this Agreement will be accomplished through implementation of the Conservation Strategy for the Alabama Sturgeon, *Scaphirhynchus suttkusi*, (“Strategy”) which is attached hereto and incorporated herein as Attachment A. Successful implementation of this Agreement and Strategy will significantly reduce or eliminate any current and potential threats to the Alabama sturgeon and its habitat.

II. GOAL

The goal of this Agreement is to eliminate or significantly reduce current threats to the Alabama sturgeon and its habitat to the extent necessary to foreclose the possibility that the Alabama sturgeon will become extinct throughout its currently occupied habitat, or the likelihood that the Alabama sturgeon will become endangered within the foreseeable future throughout its currently occupied habitat in Alabama.

III. OBJECTIVES

Accomplishment of the following objectives will be required to attain the goal of this Agreement:

Objective 1: Restore and maintain sufficient numbers of Alabama sturgeon in the lower Alabama River to ensure its long-term survival by increasing the numbers of sturgeon through hatchery propagation and augmentation.

Objective 2: Identify and protect existing occupied Alabama sturgeon habitat quantity and quality, develop information on the sturgeon’s life history and habitat needs, and use this information to implement appropriate conservation measures and adaptive management strategies for the Alabama sturgeon and its habitat.

These objectives will be accomplished through implementation of the specific measures set forth in the Agreement and Strategy. However, in accordance with the principles of adaptive management, the status of this Agreement and Strategy will be evaluated annually to assess program progress.

IV. ADDITIONAL BENEFITS

The primary focus of this Agreement is the conservation and enhancement of the Alabama sturgeon and its habitat. However, other species occurring within or adjacent to Alabama sturgeon habitat, including three federally listed mussel species and the threatened Gulf sturgeon, may also benefit. Therefore, the accomplishment of the conservation actions identified in the Strategy may significantly reduce or eliminate threats to several other species. Furthermore, this Agreement will provide additional measures to enhance Alabama sturgeon populations that cannot be required under the ESA.

V. INVOLVED PARTIES

Alabama Department of Conservation and Natural Resources
Division of Wildlife and Freshwater Fisheries
64 North Union Street
Montgomery, Alabama 36130
(334) 242-3471

United States Department of the Interior
Fish and Wildlife Service, Region 4
1875 Century Boulevard
Atlanta, Georgia 30345
(404)679-4000

U.S. Army Corps of Engineers
Mobile District
109 St. Joseph Street
Mobile, Alabama 36601
(334) 690-2511

Alabama-Tombigbee Rivers Coalition
International Trade Center
250 North Water Street
Mobile, Alabama 36602
(334) 431-9055

This Agreement may be amended to include, or separate Memoranda of Understanding and/or Cooperative Agreements may be developed with, additional parties as necessary to ensure implementation of specific conservation measures contained in this Agreement and Strategy.

The Alabama Department of Conservation and Natural Resources (“ADCNR”) will maintain the lead in the conservation efforts for the Alabama sturgeon in Alabama under this Agreement and Strategy. The U.S. Fish and Wildlife Service (“Service”), the U.S. Army Corps of Engineers, Mobile District (“Corps”) and the Alabama-Tombigbee Rivers Coalition (“Rivers Coalition”) will

cooperate and coordinate with ADCNR in the implementation of this Agreement and Strategy. Additionally, the parties to this Agreement will develop an appropriate organizational mechanism to implement and coordinate the management of this Agreement and Strategy.

VI. AUTHORITY

The signatory parties hereto enter into this Agreement and Strategy under existing federal and state law, as applicable, including, but not limited to Section 2(c)(2) of the ESA, which states that “the policy of Congress is that Federal agencies shall cooperate with State and Local agencies to resolve water resource issues in concert with conservation of endangered species.”

The ESA contributes several working tools to establish a cooperative working relationship among the parties toward conservation of the Alabama sturgeon and the habitat on which it depends. Under Section 6 of the ESA, the “Secretary shall cooperate to the maximum extent with the States. . .”, 16 USC § 1535(a). Further under Section 6, the Secretary may authorize under cooperative agreement with a State program, a State agency to establish conservation initiatives; and may provide financial assistance to the State to monitor the status of a species within a State to prevent significant risk to the well-being of any such species. 16 USC § 1535(c).

All parties to this Agreement recognize that they each have specific statutory responsibilities which cannot be delegated, particularly with respect to the management and conservation of wildlife, its habitat and the management, development and allocation of water resources. Nothing in this Agreement or Strategy is intended to abrogate any of the parties’ respective responsibilities.

This Agreement is subject to and is intended to be consistent with all applicable federal and state laws and interstate compacts.

VII. STATUS OF THE ALABAMA STURGEON

The Alabama sturgeon, *Scaphirhynchus suttkusi*, is a small, freshwater sturgeon that was historically found only in the Mobile River Basin of Alabama and Mississippi. This sturgeon is an elongate, slender fish growing to about 30 inches in length. A mature fish weighs 2 to 3 pounds. The head is broad and flattened shovel-like at the snout. The mouth is tubular and protrusive. There are four barbels on the bottom of the snout in front of the mouth. Bony plates cover the head, back and sides. The body narrows abruptly to the rear, forming a narrow stalk between the body and tail. The upper lobe of the tail fin is elongated and ends in a long filament.

While the Alabama sturgeon’s historic range consisted of about 1,000 miles of river habitat in the Mobile River Basin in Alabama and Mississippi, it has apparently disappeared from about 85 percent of its historic range. Collection efforts over the past three decades indicate that very low numbers of Alabama sturgeon continue to survive in portions of the 130 miles of the lower Alabama River in Clarke, Monroe, and Wilcox Counties, Alabama, from Millers Ferry Lock and Dam south to its confluence with the Tombigbee River.

The Alabama sturgeon was included in Federal Register notices of review for candidate species in 1982, 1985, 1989, and 1991. In the 1982 and 1985 notices (47 FR 58454 and 50 FR 37958), it was included as a category 2 species. In the 1989 and 1991 notices (54 FR 554 and 56 FR 58816), it was listed as a category 1 candidate species. On June 15, 1993, the Service published a proposed rule to list the Alabama sturgeon as endangered with proposed designation of critical habitat (58 FR 33148). The Service subsequently published a six-month extension of the deadline for the proposed rule on June 21, 1994 (59 FR 31970). On December 15, 1994, the Service withdrew the proposed listing rule (59 FR 64794) on the basis of insufficient information that the Alabama sturgeon continued to exist. On September 19, 1997, after the capture of four sturgeon had confirmed that the species still existed, the Service reclassified the sturgeon as a candidate species (62 FR 49403). On March 26, 1999, the Service published another proposed rule to list the Alabama sturgeon as endangered which did not include the proposed designation of critical habitat (64 FR 14676).

Because the primary threat to the Alabama sturgeon had been identified as its small numbers and its apparent inability to offset mortality rates with current reproduction rates, a collaborative effort by public and private partners to address this threat and conserve the species was initiated in early 1997. The ADCNR implemented the previous voluntary conservation plan for the Alabama sturgeon which addressed the immediate threat to the species, its depressed population size, and sought to develop information on the species and its habitat needs. A variety of public and private groups, including the Service, Corps, Rivers Coalition, Geological Survey of Alabama, and the Mobile River Basin Coalition participated in and/or endorsed, implementation of the plan. The immediate focus of the plan was to prevent the sturgeon's extinction through a captive breeding program and release of propagated fish. Other objectives of the voluntary plan included habitat restoration and determination of life history information essential to effective conservation and management of the species. These activities will expand and continue under this Agreement and Strategy.

VIII. PROBLEMS FACING THE SPECIES

The success of any conservation program depends on eliminating or significantly reducing the impact of current activities that threaten the species' existence. The following list summarizes the factors which must be considered by the Service, as required by Section 4(a)(1) of the ESA, in evaluating the current threats to the Alabama sturgeon. This Agreement and Strategy provide a detailed review of the current threats to the Alabama sturgeon and the actions which the signatories to this Agreement are taking to address those threats. In addition, this Agreement and Strategy establish a baseline understanding of the current threats to the Alabama sturgeon and its habitat for the purpose of providing a framework for implementation of the required conservation measures to address those threats. For consistency, the general format of the Strategy is based on the five criteria considered for federal listing of a species specified in Section 4(a)(1) of the ESA as follows.

- A. The present or threatened destruction, modification, or curtailment of its habitat or range;
- B. Overutilization for commercial, recreational, scientific, or educational purposes;
- C. Disease or predation;
- D. The inadequacy of existing regulatory mechanisms; and
- E. Other natural or manmade factors affecting its continued existence.

IX. CONSERVATION ACTIONS TO BE IMPLEMENTED

In order to accomplish the goal and objectives of this Agreement, the parties agree to undertake the specific measures set forth in the Agreement and Strategy for the Alabama sturgeon which are summarized as follows:

- A. Capture and maintain Alabama sturgeon broodstock for hatchery propagation;
- B. Develop and maintain hatchery and holding facilities and techniques for the sturgeon;
- C. Implement an intensive culture program;
- D. Protect existing occupied habitat;
- E. Conduct habitat studies;
- F. Conduct studies and develop information on life history and habitat parameters and apply this information to occupied habitat and population management strategies;
- G. Apply research results to improve occupied habitat conditions;
- H. Augment the Alabama sturgeon population in the lower Alabama River;
- I. Reintroduce the species into suitable portions of its current occupied habitat, where appropriate;
- J. Establish a process for information transfer between the involved parties and the interested public; and
- K. Utilize genetic techniques in the management of the propagation process to ensure genetic diversity.

Where responsibility for undertaking a specific action has not been assigned in this Strategy, the parties agree to implement such measures through additional agreement as appropriate.

X. CONSERVATION SCHEDULE AND ASSESSMENT

In order to effectuate this Agreement, five conservation and management activities are being implemented. These activities, as described in the Strategy, include: broodstock collection, hatchery program, habitat studies and protection, life history studies, and augment/reestablish sturgeon populations in the Alabama River. The ADCNR, Division of Wildlife and Freshwater Fisheries, will implement the conservation measures of the Agreement as set forth in the Strategy.

In addition, four general administrative actions, as outlined below, will be implemented.

Conservation Activities Coordination

Administration of the Agreement will be conducted by the Alabama Sturgeon Conservation Team (“ASCT”) in coordination with all involved parties. The ASCT will consist of a designated representative from each signatory to this Agreement and may include technical and legal advisors and other members as deemed necessary by the signatories.

Because the geographical areas of concern covered by this Agreement are located in Alabama, and because the State of Alabama has primary jurisdiction over the Alabama sturgeon within the State, the designated ASCT leader will be the ADCNR representative.

The authority of the ASCT shall be limited to developing and making recommendations for the conservation of Alabama sturgeon to the signatories to this Agreement. The ASCT leader will automatically provide copies of all comments, recommendations, and actions relating to this Agreement and Strategy to all signatories to this Agreement, and to other interested parties upon written request.

The ASCT will meet at least annually to assess the progress on implementing the Strategy, to update and develop yearly conservation schedules, and to review plans, budgets and funding requirements.

The ASCT will meet in February 2004 to reevaluate the overall progress and effectiveness of the Strategy and its implementation for the remaining five-year term of the Agreement.

ASCT meetings will be open to interested parties. Minutes of the meetings and progress reports will be kept and timely distributed to the ASCT members and their technical and legal advisors. Minutes and progress reports will also be distributed to other interested parties, upon written request, by the ASCT leader.

Conservation Schedule Implementation

All conservation actions set forth in the Strategy will be implemented upon execution of this Agreement by all signatories and will remain in effect for the life of the Agreement. The timetable for completion of specific conservation measures is set forth in the Strategy. Where no timetable for completion is specified, the timing of such actions will be determined by the ASCT.

As leader of the ASCT, ADCNR will coordinate the conservation activities and monitor the conservation actions being conducted by the signatories to this Agreement to determine whether all actions are in accordance with the Agreement and Strategy and the annual schedule in the Action Plan.

Conservation Funding Responsibilities

Funding for this Agreement and Strategy will be provided by a variety of sources as set forth in the Strategy. Federal, state, local and private sources will provide or secure funding to initiate the activities as specified in the Agreement and Strategy, including but not limited to:

- Federal sources including, but not limited to, the Service and the Corps.
- State sources including, but not limited to, ADCNR, other State resource management agencies, and direct appropriation of funds by the Alabama legislature.
- Local and private sources, including but not limited to, the Rivers Coalition and its member companies and organizations.

In-kind contributions in the form of personnel, field equipment, supplies etc., will be provided by participating agencies and organizations, as necessary. In addition, each agency and organization

will have specific tasks, responsibilities, and proposed actions/commitments related to its in-kind contributions.

It is projected that the conservation actions involved with the collection of broodstock and implementation of the captive propagation program will require the greatest expense during the first three years of the Agreement.

It is further understood that some of the funding commitments made under this Agreement are subject to approval by appropriate local, state or federal appropriations. This Agreement does not commit any entity to spend resources beyond its authority and available appropriations.

Conservation Progress Assessment

An annual assessment of progress toward implementing the conservation activities and actions identified in this Agreement and Strategy will be provided by the ASCT leader to the signatories to this Agreement. This assessment will be based on updates and evaluations by ASCT members. This assessment will determine the effectiveness of this Agreement and whether revisions are warranted.

If threats to the survival of the Alabama sturgeon become known that are not or cannot be resolved through this or any conservation agreement, the ASCT leader will promptly notify all signatories to this Agreement.

XI. DURATION AND AMENDMENT OF AGREEMENT

The term of this Agreement shall be ten years. In February 2004, a thorough analysis of actions implemented for the conservation of the Alabama sturgeon will be conducted by the ASCT. Changes to this Agreement and Strategy may be made upon agreement in writing by all of the signatories to this Agreement. Any party may withdraw from this Agreement on sixty (60) days written notice to the other parties.

XII. EFFECT OF AGREEMENT ON THE LISTING DECISION

It is the intention of the parties that the execution and implementation of this Agreement and Strategy will eliminate or significantly reduce current and potential threats to the Alabama sturgeon and that the benefits provided by this Agreement and Strategy will be considered by the Secretary when making the Alabama sturgeon listing decision within the meaning of the ESA.

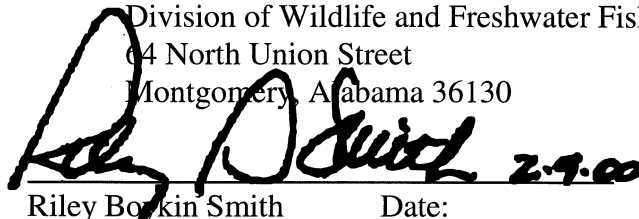
XIII. RESERVATION OF RIGHTS

Nothing herein shall be construed as an agreement by any other party to this Agreement that any action proposed by the Service is appropriate or as waiving the right of any such party to contest or oppose such action.

XIV. SIGNATORIES

Alabama Department of Conservation and Natural Resources

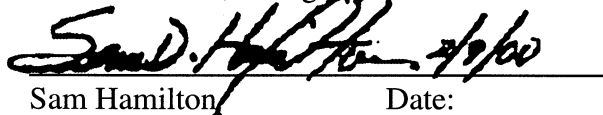
Division of Wildlife and Freshwater Fisheries
64 North Union Street
Montgomery, Alabama 36130

 2-9-00

Riley Borkin Smith Date:
Commissioner

U.S. Department of the Interior

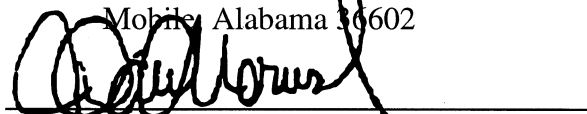
Fish and Wildlife Service, Region 4
1875 Century Boulevard
Atlanta, Georgia 30345

 2/9/00

Sam Hamilton Date:
Regional Director

U. S. Army Corps of Engineers

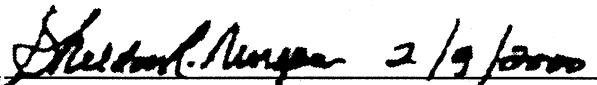
Mobile District
109 St. Joseph Street
Mobile, Alabama 36602



Col. David Norwood Date:
District Engineer

Alabama-Tombigbee Rivers Coalition

International Trade Center
250 North Water Street
Mobile, Alabama 36602

 2/9/2000

Sheldon L. Morgan Date:
Chairman

**CONSERVATION STRATEGY
FOR THE ALABAMA STURGEON**
Scaphirhynchus suttkusi

PURPOSE

The purpose of this document is to describe specific actions and strategies required to expedite implementation of conservation measures for the Alabama sturgeon to ensure the long-term viability of the species, and to establish benchmarks to measure the success of the program. The general conservation goals are to increase sturgeon numbers to a viable, self-sustaining level; maintain habitat currently occupied by the sturgeon; conduct research necessary to understand sturgeon life history and ecology and use this information to manage the species; identify occupied habitat within the lower Alabama River that might support sturgeon with appropriate management; and insure sturgeon accessibility to essential habitat that is identified through research.

INTRODUCTION

During the spring of 1996, members of the Alabama-Tombigbee Rivers Coalition (“Rivers Coalition”) and the U.S. Fish and Wildlife Service (“Service”) began discussions to develop and implement a conservation plan for the Alabama sturgeon that could receive wide public support. A voluntary conservation plan was subsequently endorsed by the Service, Alabama Department of Conservation and Natural Resources (“ADCNR”), U.S. Army Corps of Engineers, Mobile District (“Corps”), and the Rivers Coalition. The voluntary conservation plan (copy attached at Appendix A) proposed to fund and implement an initial five-year program to develop sturgeon life history information through capture, tagging and telemetry; capture of broodstock for potential population augmentation; construction of hatchery facilities for sturgeon propagation; and habitat identification and quantification in the lower Alabama River.

The voluntary conservation plan was initiated with \$290,000 in federal funding in fiscal year (“FY”) 1997 and has been continued with additional federal funding in the amount of \$400,000 per year in FY 1998, 1999, and 2000. In March 1997, ADCNR implemented the collection and hatchery components of the voluntary conservation plan, which has resulted in the collection of five sturgeon to date.

Recognizing that recovery of the Alabama sturgeon to self-sustaining levels will be an extended multi-year process, the parties to this Agreement have agreed to convert the existing voluntary conservation plan into a formal Conservation Agreement and Strategy for the Alabama Sturgeon in order to continue the ongoing cooperative effort between the state and federal resource agencies and the private sector. This ten-year Agreement establishes an intensive multi-year program to develop the funding, partnerships, techniques, and information necessary to accomplish this long-term goal. The first five years of conservation efforts under this Agreement and Strategy are primarily devoted to addressing the small population size of the Alabama sturgeon, including collecting brood fish and developing hatchery facilities and methods, and introducing hatchery spawned fish into the lower Alabama River to augment the current population. It also seeks to protect and maintain currently occupied habitat, and to develop life history and habitat information

necessary to appropriately manage the species for long-term survival. This Agreement and Strategy is intended to incorporate, as necessary, any new information developed during the initial five-year period through adaptive management techniques, including that relating to habitat protection or management. The parties to this Agreement expect to re-examine this Conservation Strategy on at least an annual basis in order to modify the conservation actions specified in this Strategy, if necessary. Year five of the Agreement provides for a formal review of the Strategy, its modification, if necessary, and for its continuation for an additional five years. Implementation of this Agreement and Strategy can also be expected to benefit other species, including sport and commercial fisheries, endangered and threatened mussels and fish, and other aquatic species of concern.

DEFINITIONS

A. Occupied Habitat - The 130 miles of the lower Alabama River in Clarke, Monroe, and Wilcox Counties, Alabama, from Millers Ferry Lock and Dam south to its confluence with the Tombigbee River.

B. Adaptive Management - Means a structured method for addressing uncertainty and learning by doing. It includes examining alternative strategies for meeting the Strategy's goals and objectives, and adjusting future management tasks and objectives according to what is learned. Adaptive management, broadly defined, includes the following components:

- L. careful planning through identification of uncertainty,
- M. incorporating a range of alternatives,
- N. implementing a sufficient monitoring program to determine the success of the alternatives, and
- O. a feedback loop from the results of the monitoring program that allow decisions for change in management strategy.

C. Water Resource Development - Means navigation, flood control, hydropower, recreation, sand and gravel mining, point and nonpoint source discharges, and other human uses.

SPECIES DESCRIPTION

The Alabama sturgeon (*Scaphirhynchus suttkusi*) is a small, freshwater sturgeon that was historically found only in the Mobile River Basin ("Basin") of Alabama and Mississippi. This sturgeon is an elongate, slender fish growing to about 80 centimeters (cm)(30 inches (in)) in length. A mature fish weights 1 to 2 kilograms (kg) (2 to 3 pounds (lb)). The head is broad and flattened shovel-like at the snout. The mouth is tubular and protrusive. There are four barbels on the bottom of the snout in front of the mouth. Bony plates cover the head, back and sides. The body narrows abruptly to the rear, forming a narrow stalk between the body and tail. The upper lobe of the tail fin is elongated and ends in a long filament.

LIFE HISTORY

Very little is known of the life history, habitat, or other ecological requirements of the Alabama sturgeon. Observations by Burke and Ramsey (1985) indicate the species prefers relatively stable gravel and sand substrates in flowing river channels. Verified captures of Alabama sturgeon

have primarily occurred in large channels of big rivers. However, at least two historic records were from oxbow lakes (Williams and Clemmer 1991). Examination of stomach contents of museum and captured specimens show that these sturgeon are opportunistic feeders preying primarily on aquatic insect larvae (Mayden and Kuhajda 1996). Mayden and Kuhajda (1996) deduced other aspects of Alabama sturgeon life history by a comparative review of spawning habits of its better known sister species, the shovelnose sturgeon. The life history of the shovelnose sturgeon has also been recently summarized by Keenlyne (1997). This information on shovelnose sturgeon indicates that Alabama sturgeon are also likely to migrate upstream during late winter and spring to spawn. Downstream migrations may occur in search of feeding and summer refugia areas. Although the sturgeon's spawning habitat has yet to be identified, eggs are probably deposited on hard bottom substrates such as bedrock, armored gravel, or channel training works in deep water habitats, and possibly in tributaries to major rivers. Sturgeon eggs are adhesive and require current for proper development. Sturgeon larvae are planktonic, drifting with river currents. Following yolk absorption, juvenile sturgeon begin feeding on minute planktonic crustaceans, but soon become bottom feeders and dwellers. Sexual maturity of sturgeon is believed to occur between 5 to 7 years of age. Spawning frequency of both sexes is influenced by food supply and fish condition, and may occur every 1 to 3 years. Alabama sturgeon may live up to 15 years of age.

HISTORIC DISTRIBUTION

The Alabama sturgeon's historic range consisted of about 1,600 kilometers (km) (1,000 miles (mi)) of river habitat in the Basin in Alabama and Mississippi. There are records of sturgeon captures from the Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers (Burke and Ramsey 1985, 1995). Once common in Alabama, and perhaps also in Mississippi, the total 1898 commercial catch of "shovel-nose" sturgeons (i.e., Alabama sturgeon) from Alabama was reported as 19,000 kilogram (kg) (42,900 pounds (lb)) in a statistical report to Congress (U.S. Comm. Fish & Fisheries 1898). Of this total, 18,000 kg (39,500 lb) came from the Alabama River and 1,000 kg (2,300 lb) from the Black Warrior River. Given that an average Alabama sturgeon weighs about 1 kg (2 lb), the 1898 commercial catch consisted of approximately 20,000 fish. These records indicate a substantial historic population of Alabama sturgeon around the turn of the century.

Between the 1898 report and 1970, little information was published regarding the Alabama sturgeon. An anonymous article published in the *Alabama Game and Fish News* in 1930 stated that the sturgeon was not uncommon; however, by the 1970s, it had become rare. In 1976, Ramsey documented only six specimens from museums. Clemmer (1983) was able to locate only 23 Alabama sturgeon specimens in museum collections, with the most recent collection dated 1977.

During the mid-1980s, Burke and Ramsey (1985) conducted a status survey to determine the distribution and abundance of the Alabama sturgeon. Interviews were conducted with commercial fishermen on the Alabama and Cahaba Rivers, some of whom reported catch of Alabama sturgeon as an annual event. However, during their collection efforts in areas identified by fishermen, Burke and Ramsey were able to collect only five Alabama sturgeons, including two males, two gravid females, and one juvenile about 2 years old. Burke and Ramsey (1985) concluded that the Alabama sturgeon had been extirpated from 57 percent (950 km or 600 mi) of its range and that only 15 percent (250 km or 150 mi) of its former habitat had the potential to support a good population. An

additional sturgeon was taken in 1985 in the Tensaw River and photographed, but the specimen was lost (Mettee, Geologic Survey of Alabama, pers. Comm. 1997).

In 1990 and 1992, biologists from the ADCNR with the assistance of the Corps, conducted searches for Alabama sturgeon using a variety of sampling techniques, without success (Tucker and Johnson 1991, 1992). However, some commercial and recreational fishermen continued to report occasional catches of small sturgeon in Millers Ferry and Claiborne reservoirs and in the lower Alabama River (Tucker and Johnson 1991, 1992).

In 1993, Service biologists and ADCNR personnel conducted another extensive survey for Alabama sturgeon in the lower Alabama River. On December 2, 1993, a mature male was captured in a gill net downstream of Claiborne Lock and Dam. That specimen represented the first confirmed record of Alabama sturgeon in about nine years. The fish was moved to a fish hatchery where it later died.

On April 18, 1995, an Alabama sturgeon which had been captured by recreational fishermen below Claiborne Lock and Dam was turned over to ADCNR and Service biologists. That fish was examined, radio-tagged, and returned to the river where it was tracked for four days before the transmitter switched off. On May 19, 1995, Service biologists captured another Alabama sturgeon in Monroe County, Alabama, near the 1993 collection site. Unfortunately, shortly after the fish was tagged and released, it was found entangled and dead in a vandalized gill net lying on the river bottom. On April 26, 1996, a commercial fisherman caught, photographed, and released an Alabama sturgeon in the Alabama River south of Millers Ferry Lock and Dam (Reeves, ADCNR, pers. comm. 1996).

CURRENT DISTRIBUTION

The Alabama sturgeon has apparently disappeared from about 85 percent of its historic range, including the upper Tombigbee, lower Black Warrior, lower Tallapoosa, and upper Cahaba Rivers, where it was last reported in the 1960's; the Mobile-Tensaw Delta, last reported in 1985; the lower Coosa, last reported around 1970; lower Tombigbee, last reported around 1975; and lower Cahaba, last reported in 1985. (Clemmer 1983; Burke and Ramsey 1985, 1995; Williams and Clemmer 1991; Mayden and Kuhajda 1996).

As a result of the broodstock collection effort which began in March of 1997 as a component of the voluntary conservation plan, personnel from the ADCNR caught an Alabama sturgeon on April 9, 1997, immediately below Claiborne Lock and Dam. That fish was transported to the Marion State Fish Hatchery.

ADCNR continued fishing for sturgeon through the fall and winter of 1997 and collected another sturgeon below Miller's Ferry Lock and Dam on December 10, 1997. That fish was also transported to the Marion State Fish Hatchery, where both fish were acclimated to the hatchery and held for use as broodstock. In January 1998, the two fish were biopsied to determine their sex. The April specimen was determined to be a mature female with immature eggs, whereas the December fish was determined to be a mature male.

Continued broodstock collection efforts in 1998 by ADCNR resulted in the capture of another sturgeon on November 12, 1998. A biopsy performed in December determined that fish was a reproductively inactive male. The two 1997 fish were also biopsied at that time, and were determined to be candidates for propagation in the spring of 1998.

On April 15, 1999, another sturgeon was captured by recreational fishermen, approximately 800 yards downstream from Claiborne Lock and Dam. The catch was reported to nearby ADCNR personnel, who recovered the sturgeon and transported it to the Marion State Fish Hatchery.

Another sturgeon was caught on July 31, 1999, by commercial fishermen using gill nets in the Claiborne Pool. After releasing the fish back into the river, they notified ADCNR personnel who immediately dispatched a capture crew to the river. Approximately 19 days later, ADCNR personnel captured what they believed was the same sturgeon near the same spot where it had been released. The fish was transported to the Marion State Fish Hatchery where it died three days later, apparently from stress due to the dual capture process.

Consequently, the results of recent collection efforts (Tucker and Johnson 1991, 1992; Paruka, USFWS, pers. comm. 1995; Reeves, ADCNR, pers. comm. 1996; Killgore *et. al* 1998) indicate that very low numbers of Alabama sturgeon continue to survive in portions of the 130 mile length of the lower Alabama River below Millers Ferry and Claiborne Locks and Dams.

CAUSES OF HISTORIC DECLINE

The historic population decline of the Alabama sturgeon was probably initiated by unrestricted harvesting near the turn of the century. Although there are no reports of commercial harvests of Alabama sturgeon after the 1898 report, it is reasonable to assume that sturgeon continued to be affected by the commercial fishery. Keenlyne (1997) noted that in the early years of this century, shovelnose sturgeon were considered a nuisance to commercial fishermen and were destroyed when caught. Interviews with commercial and recreational fishermen along the Alabama River indicated that a few Alabama sturgeon continued to be taken into the 1980's (Burke and Ramsey 1985). Studies of other sturgeon species suggest that newly exploited sturgeon fisheries typically show an initial high yield followed by rapid declines. Almost all sturgeon species throughout the country experienced dramatic and precipitous range-wide declines from historical abundance levels around the turn of the century (1880-1930) due to over-fishing, habitat loss and watershed development, and with continued exploitation and habitat loss there may be little or no subsequent recovery, even after nearly a century (National Paddlefish and Sturgeon Steering Committee Report 1993, Birstein 1993). That same phenomenon apparently occurred to the Basin's sturgeons, both Gulf and Alabama sturgeon.

Although unrestricted commercial harvesting of the Alabama sturgeon may have significantly reduced its numbers and initiated a serious population decline, the historic curtailment of the Alabama sturgeon's range also resulted from 100 years of cumulative impacts to the rivers of the Basin as they were developed for navigation, power production, flood control, recreation and other human uses. Water resource development of the Basin affected the sturgeon in several ways. That development significantly changed and modified extensive portions of river channel habitats, blocked long-distant movements, including migrations, and fragmented and isolated sturgeon populations.

The Basin's major rivers are now controlled by more than 30 dams, forming a series of reservoirs that are interspersed with free-flowing reaches of varying lengths. Within the sturgeon's historic range there are three dams on the Alabama River (built between 1968 and 1971), two on the Black Warrior River (completed by 1959), and six on the Tombigbee River (built between 1954 and 1979). These 11 dams affect and fragment 583 miles (970 km) of river channel habitat. Riverine (flowing water) habitats appear to be required by the Alabama sturgeon to successfully complete its life cycle. Alabama sturgeon habitat requirements may not be met in impoundments where low flows result in accumulations of silt making bottom habitats unsuitable for spawning, and perhaps for the bottom dwelling invertebrates on which the sturgeons evidently feed.

Prior to widespread construction of dams throughout the Basin, Alabama sturgeon could move freely between feeding areas, and from feeding areas to sites that favored spawning and development of eggs and larvae. Additionally, the sturgeon may have sought thermal refuges during summer months when high water temperatures became stressful. Such movements might have been extensive, since other *Scaphirhynchus* species of sturgeons are known to make long distance movements exceeding 250 km (150 mi) (Moos 1978; 1985, Bramblett 1996). Dams, however, fragmented the sturgeons' range, forming isolated populations between the dams where all their habitat needs may not necessarily be met. With avenues of movement and migration restricted, these populations also became more vulnerable to local declines in water and habitat quality caused by riverine and land management practices and/or polluting discharges.

Portions of the major rivers within the historic range of the Alabama sturgeon have been dredged and/or channelized to make them navigable. The lower Alabama, Black Warrior, Tombigbee and Mobile Rivers are routinely dredged in areas of natural deposition to maintain nine foot channel depths for navigation. Dredged and channelized river reaches, in comparison to natural river reaches, have reduced habitat diversity (e.g., loss of shoals, removal of snags, removal of bendways, reduction in flow heterogeneity, etc.) which generally results in decreased aquatic diversity and productivity (Hubbard et al. 1988 and references therein). The deepening and destruction of shoals and shallow runs or other historic feeding and spawning sites, which was necessary for navigation development, likely contributed to overall historic declines in range and abundance of the Alabama sturgeon.

Dams constructed for navigation, power production, flood control, recreation, land development and other human uses also affected the quantity and timing of water moving through the Basin. Water depths for nine foot navigation channels are partially controlled through water discharges from upstream dams, and flows have also been changed as a result of hydroelectric production by upstream dams (Buckley 1995; Freeman and Irwin, U.S. Geological Survey, pers. comm. 1997).

The construction and operation of dams and development of navigation channels were likely significant factors in the curtailment and/or alternation of the historic range of the Alabama sturgeon, and in defining its current distribution. Nevertheless, while these existing structures and activities are now part of the ecology in the Basin and are likely to remain, the present effects of the operation of these structures, flow regulation, and navigation maintenance activities on the sturgeon are poorly understood. This is due in large part to lack of specific information on the behavior, life cycle and ecology of the Alabama sturgeon.

In summary, the Alabama sturgeon has undergone marked declines in population size and range during the past century. However, the sturgeon is now protected by Alabama State law from commercial and recreational fishing, and major actions affecting the waterways are now regulated and upon their completion years ago have effectively become part of the environmental and economic baseline (e.g., dams, impounded river segments, navigation channels). Therefore, conservation and management strategies for the Alabama sturgeon against this background of existing infrastructure development will depend upon the development of a better understanding of the species itself.

PRIMARY PROBLEMS FACING THE STURGEON

The success of any conservation program depends on eliminating or reducing the threats to the species' existence. Several problems and threats have been identified for the Alabama sturgeon. These threats are summarized below, based on the five criteria for federal listing as required by Section 4(a)(1) of the Endangered Species Act of 1973, as amended ("ESA"), and will be addressed by specific conservation actions described in this Agreement and Strategy.

(A) *The present or threatened destruction, modification, or curtailment of its habitat or range*

The Alabama sturgeon has apparently disappeared from about 85 percent of its historic range, and now appears restricted to the 130 mile (216 km) reach of the lower Alabama River below Millers Ferry and Claiborne Locks and Dams. Impoundment, navigation channel development, flow modifications, past pollution events, and other water resource development activities have been implicated in the curtailment of the historic range of the Alabama sturgeon. Sturgeon larvae are planktonic upon hatching, drifting with the rivers' current, and eventually settling out to a benthic juvenile form. In the upper Missouri and Yellowstone Rivers, for example, shovelnose sturgeon appear to require about 109 miles of riverine condition below spawning areas for successful recruitment (Steve Krentz, pers. comm. 2000). The lower Alabama River dams apparently impede migration of Alabama sturgeon to upstream habitats that may be essential for feeding, spawning, and/or larval development. However, it is currently not known whether the quantity of fluvial (stream) habitat presently available to the species in the currently occupied habitat is inadequate to meet all of the sturgeon's life history needs.

At the present time, current flow quantity is believed to be adequate to sustain the sturgeon in the lower Alabama River. In addition, while the effect of daily flow fluctuations from the two existing federal hydroelectric facilities in the lower Alabama River (Jones Bluff and Millers Ferry) may have an effect on the sturgeon's reproductive, larvae or juvenile habitat requirements, the importance of the lower Alabama River for sturgeon reproduction is currently unknown. Also, while the most visible continuing navigation impact within currently occupied Alabama sturgeon habitat in the lower Alabama River is maintenance dredging of navigation channels, there is no evidence that it currently constitutes a limiting factor to the Alabama sturgeon's continuing existence.

Sand and gravel mining has been blamed for historic adverse impacts on riverine habitats in the lower Alabama River. However, there are no currently active sand and gravel dredging operations in the Alabama River, nor in the views of the parties to this Agreement, are there likely to be any such mining operations in the future due to stringent permitting requirements.

While water pollution was cited as a likely factor in the historic decline of the Alabama sturgeon, available information indicates that water pollution does not pose a current threat to the Alabama sturgeon. Current water quality in the lower Alabama River has improved over the years and is viewed as being “generally good” (64 FR 14681). The water quality standards adopted by the State of Alabama have been reviewed by the U.S. Fish and Wildlife Service and are considered to be fully protective of the Alabama sturgeon. The proposed listing rule for the Alabama sturgeon indicated that two localized river segments above Claiborne Lock and Dam have been reported as occasionally impaired in the past, but that information was based on the Alabama Department of Environmental Management’s (“ADEM”) 1994 Water Quality Report to Congress for calendar years 1992 and 1993. More recent reports, including ADEM’s 1996 and 1998 biannual reports and ADEM’s 1998 Section 303(d) List submitted to EPA in August 1998, indicate that all segments of the lower Alabama River are not impaired and fully support their “Fish and Wildlife,” or higher, designated uses. However, it is understood that the existing ADEM data may be inadequate to fully address water quality issues. Therefore, additional monitoring of the water quality in occupied habitat of the Alabama sturgeon will provide greater insight into this issue and is provided for in this Strategy.

In summary, the historic threats to habitat described above are not perceived to be current or future threats to the Alabama sturgeon as long as there is no change in the current situation. There is no information available that would indicate that the current situation is likely to change. Furthermore, this conservation strategy ensures that the current habitat conditions for the Alabama sturgeon will be stabilized and improved over the next ten years.

(B) *Overutilization for commercial, recreational, scientific, or educational purposes.*

Alabama State law (sect. 220-2-.26-4) protects the Alabama sturgeon and other sturgeons requiring that “...any person who shall catch a sturgeon shall immediately return it to the waters from whence it came with the least possible harm.” As a result, sturgeon are not currently pursued by commercial or recreational fishermen. In addition, scientific and educational collections are also controlled by State regulation. Consequently, these activities do not currently constitute a threat to the Alabama sturgeon.

(C) *Disease or predation.*

There are no known threats to the Alabama sturgeon currently recognized due to disease or predation. Therefore, this factor does not constitute a current threat to the Alabama sturgeon.

(D) *The inadequacy of existing regulatory mechanisms.*

In addition to Alabama state law prohibitions against recreational and commercial exploitation of sturgeons discussed above in Factor (B), there are a myriad of existing federal, state and local laws which provide additional protections for the Alabama sturgeon and its habitat. For example, the Lacey Act, which makes it illegal to import, export or engage in interstate transport of fish or wildlife in violation of a state law, allows for federal prosecutions for violations of state laws (and in many cases more stringent penalties) and serves as a further deterrent to capture and transport of illegally-possessed Alabama sturgeon. Further, a wide variety of federal laws, including but not limited to, the Federal Water Pollution Control Act (known as the Clean Water Act), Fish and Wildlife Coordination Act, National Environmental Policy Act, Federal Power Act and Rivers and Harbors

Act, along with numerous counterpart state laws and local ordinances, affect projects and activities which might adversely impact the Alabama sturgeon or its habitat. Even without being listed, the fact is that the Alabama sturgeon has already been the focus of project reviews and federal and state permitting processes, and more importantly, the beneficiary of project conditions, modifications or denials, even in situations where the Alabama sturgeons' needs were not explicitly considered.

Moreover, Alabama sturgeon are also the beneficiaries of ESA requirements for federal agency consultations for three federally listed mussel species (inflated heelsplitter, heavy pigtoe, and southern clubshell) and the Gulf sturgeon. The ranges, habitat and conservation needs of the two sturgeon are similar and, during at least part of the year, they both live in part of the same river reaches in the Basin.

Finally, existing federal and state authorities have provided the funding and coordination for Alabama sturgeon research and conservation efforts through the ongoing voluntary conservation plan. Over the past three years, more than \$1 million in federal and state funding has been obtained and deployed to implement the voluntary conservation plan (and another \$400,000 has been provided in FY2000), which has already produced more information and scientific knowledge about the Alabama sturgeon than was ever known before.

Therefore, evaluation of the existing regulatory mechanisms under this factor also fails to constitute a current threat to the Alabama sturgeon.

(E) *Other natural or manmade factors affecting its continued existence.*

The primary threats currently facing the Alabama sturgeon are its low numbers and its apparent inability to offset mortality rates with current reproduction rates. Incidents of capture of Alabama sturgeon have been steadily diminishing over the past several decades, indicating declining population numbers over that time. Although there are no population estimates for the Alabama sturgeon, recent collection efforts demonstrate its rarity. For example, beginning in the spring of 1997 through the present, up to four crews of professional fisheries biologists have expended more than 4,000 man hours of fishing effort in the lower Alabama River to capture Alabama sturgeon for use as broodstock as part of the voluntary conservation plan, resulting in the capture of four Alabama sturgeon. During this time, commercial and recreational fishermen encountered on the River have been interviewed and asked to report any captures of sturgeon to the ADCNR. Only two incidental sturgeon catches have been reported, one of which was delivered to ADCNR personnel. Thus, three years of fishing by biologists and commercial and recreational fishermen has resulted in the capture of only five Alabama sturgeon. The amount of effort currently required to capture Alabama sturgeon strongly suggests that the species is extremely rare, and collection history indicates that the species apparently continues to decline.

In summary, evaluation of this factor indicates that the depressed population size and the apparent inability to offset mortality rates with current reproduction rates pose the current threats to the Alabama sturgeon. These threats are compounded by a lack of knowledge of the life history and ecological requirements of this species.

CONSERVATION GOALS AND OBJECTIVES

Currently, the limiting factors to the management and conservation of Alabama sturgeon and its habitat are its rarity, and insufficient general and specific knowledge of the species' ecological and life history needs. Therefore, the goals and objectives of this ten-year conservation effort are to increase the numbers of Alabama sturgeon through hatchery propagation and augmentation, protect existing occupied habitat quantity and quality, develop information on life history and habitat needs, and use this information to develop and implement conservation measures and adaptive management strategies for the species and its habitat.

Objectives:

- Capture and maintain Alabama sturgeon broodstock for hatchery propagation;
- Develop and maintain hatchery and holding facilities and techniques for the sturgeon;
- Implement an intensive culture program;
- Protect existing occupied habitat;
- Conduct habitat studies;
- Conduct studies and develop information on life history and habitat parameters and apply this information to occupied habitat and population management strategies;
- Apply research results to improve occupied habitat conditions;
- Augment the Alabama sturgeon population in the lower Alabama River;
- Reintroduce the species into suitable portions of its current occupied habitat, where appropriate;
- Establish a process for information transfer between the involved parties and the interested public; and
- Utilize genetic techniques in the management of the propagation process to ensure genetic diversity.

BENCHMARKS

Although the ultimate goal of this ten-year Agreement and Strategy is to ensure a self-sustaining population of the Alabama sturgeon in the Alabama River, natural reproduction of hatchery spawned sturgeon in the lower Alabama River is not likely to occur for at least eight years following successful augmentation. Therefore, the success of implementation during the life of this Agreement and Strategy will be measured by annual reviews to address: (1) successful collection of broodstock, (2) successful hatchery propagation, (3) initial augmentation of the remaining wild stock of the species with hatchery spawned fish, (4) protecting existing occupied habitat, (5) extending knowledge of the species' natural history, life cycle and ecological needs, and (6) development and implementation of appropriate adaptive management strategies to conserve the species.

The Benchmarks established above and the Action Plan set forth identified below address the primary problems currently confronting the species. (See discussion of the five factors under "Primary Problems Facing the Sturgeon," above). Benchmarks 1-3 address the current low numbers of Alabama sturgeon and their apparent inability to reproduce. (Factor E). Although there are no imminent threats currently identified under Factors A and D, Benchmarks 4-6 address the identification and protection of existing occupied habitat to provide additional benefits for the species, as well as addressing additional regulatory considerations to provide additional benefits for

the species and its habitat. There are no imminent threats to the species currently identified under Factors B and C.

SUMMARY OF CONSERVATION AND MANAGEMENT ACTIVITIES SINCE 1997

BROODSTOCK COLLECTIONS

Sufficient broodstock for hatchery propagation of Alabama sturgeon is needed to address the primary threat to the species. Telemetry and mark/recapture studies of captured fish are important to identify essential habitats, and to determine population size and demographics of the species.

ACCOMPLISHMENTS TO DATE: Since 1997, a voluntary five-year \$2 Million conservation effort has been implemented and coordinated by the Fisheries Section, Division of Wildlife and Freshwater Fisheries of ADCNR. Collection of broodstock has been a primary component of that effort. ADCNR, with federal funding provided through the Service, has provided the majority of manpower for this effort. In addition, personnel from the Service, U.S. Army Corps of Engineers Waterway Experiment Station (WES), Alabama Geological Survey, and Alabama Power Company have also provided various levels of manpower assistance. These efforts by professional fisheries biologists have expended over 250 field days of fishing effort to collect Alabama sturgeon broodstock to date. A field day refers to one collection team (usually two people) on the water actively fishing gear. A variety of gear, methods, and baits have been used in collections. However, trotlines have historically and currently been the most productive gear in the catch of Alabama sturgeon. Successful protocols have been established for handling and transporting captured sturgeon (copies attached at Appendix B). The fishing effort has resulted in the capture of five sturgeon since 1997, and two of these fish currently survive at the Marion State Fish Hatchery.

HATCHERY PROGRAM

Population augmentation will require the use of state hatchery facilities and expertise. Hatchery reared fish can also be used in studies of physical and life history requirements, and to determine contaminant sensitivities.

ACCOMPLISHMENTS TO DATE: Facilities have been constructed, and equipment purchased to hold and propagate Alabama sturgeon at the ADCNR Marion State Fish Hatchery. A 3500 square foot metal framed and roofed tank shed has been constructed and devoted to sturgeon broodstock holding tanks and initial larval and post-larval culture activities. Three new eight foot diameter circular tanks have been assembled and installed, and sites have been prepared for assembly of two new 20 ft tanks. In 1999, the former Claude Harris National Aquacultural Research Laboratory, which adjoins the Marion State Fish Hatchery, was conveyed to ADCNR. The large wet lab at this facility has been identified as being readily adaptable for use for sturgeon fingerling culture. Contingency and budget plans have been developed to convert this facility for use as a sturgeon fingerling culture facility. Methods to sex and determine reproductive status have been developed and successfully used to sex captive fish. Propagation methods and protocols have been identified (copies attached at Appendix C). Hatchery personnel have been trained in handling, sexing, and propagating sturgeon. A mature male and female sturgeon captured during 1997 were induced to spawn on March 27, 1999. The female produced over 4,000 mature eggs; however, the male failed to produce sperm and the fertilization attempt was

unsuccessful. On April 4, 1999, the captive female died from a bacterial infection that was apparently triggered by the spawning process. Two fish, both males, remain in captivity at the Marion State Fish Hatchery.

HABITAT STUDIES AND PROTECTION

Alabama sturgeon spawning, feeding, and refuge habitats and habitat parameters (i.e., water quality) in the wild are currently undocumented. These habitats and parameters must be identified and prioritized for species management and protection. Until essential habitat requirements are known, management strategies to identify and protect currently occupied riverine channel features, stability, and water quality will be emphasized.

ACCOMPLISHMENTS TO DATE: Numerous federal and state actions and regulatory activities have been reviewed for effects on Alabama sturgeon. One such action occurred during November 1994, whereby the Corps and the Service prepared and adopted a White Paper entitled "Federal Activities That May Affect the Alabama Sturgeon and Anticipated Section 7 Consultations on These Activities"(November 18, 1994). This White Paper addressed the effects of a potential Alabama sturgeon listing and determined that "Corps current activities in the Alabama River including the annual navigation channel maintenance dredging programs, use of training devices, maintenance dredging for non-Federal activities, and changes in river flow patterns will have 'no effect' on the sturgeon and will not need to be eliminated, modified or altered should the Alabama sturgeon be listed for protection under the Endangered Species Act." The above determination was included in a letter dated November 28, 1994, from the Service, was reaffirmed by the Service's Regional Director in a letter dated June 24, 1999, and was further affirmed in a Corps response dated November 15, 1999. Coordinated studies have been conducted by the Service, ADCNR, and Corps to identify and quantify stable riverine habitat in the lower Alabama River, and to develop strategies for its continuing multiple use management. The Corps' Alabama River navigation maintenance dredging program has been examined for effects on stable instream habitats. That examination revealed there is no evidence that maintenance dredging for navigation currently constitutes a limiting factor to the Alabama sturgeon or its habitat. Mussel beds (stable channel areas that may be important sturgeon feeding areas) have been identified and delineated for dredge avoidance. Bathymetric data has been developed by the Corps for the lower Alabama River below Claiborne Lock and Dam. Habitat parameters at historic sturgeon collection sites and bathymetry data of the lower Alabama River are being compiled into a GIS database. The draft Mobile River Basin Aquatic Ecosystem Recovery Plan has been compiled and released. Implementation and finalization of that ecosystem recovery plan will benefit all aquatic species in the Basin, including the Alabama sturgeon.

LIFE HISTORY STUDIES

No eggs, larvae, or young of year Alabama sturgeon have ever been collected. Diets and feeding habits of the species are poorly known. Breeding, larval, and juvenile habitats are unknown. Migration and movement habits have not been identified. That information is essential for the development of current and future management strategies and decisions.

ACCOMPLISHMENTS TO DATE: Prey density studies are in progress by the Service, and larval and young-of-year fish surveys have been conducted in the lower Alabama River. Information has been developed on shovelnose and pallid sturgeon as a result of other existing hatchery programs and surveys for those species in the Mississippi River Basin. This information is being examined for its applicability to the Alabama sturgeon.

AUGMENT/REESTABLISH STURGEON POPULATIONS IN THE ALABAMA RIVER

To increase lower Alabama River sturgeon populations to self-sustaining levels, population augmentation with hatchery reared fish will be necessary. Re-establishment of thriving Alabama sturgeon populations in currently occupied riverine portions of the lower Alabama River would reduce stochastic threats to the species.

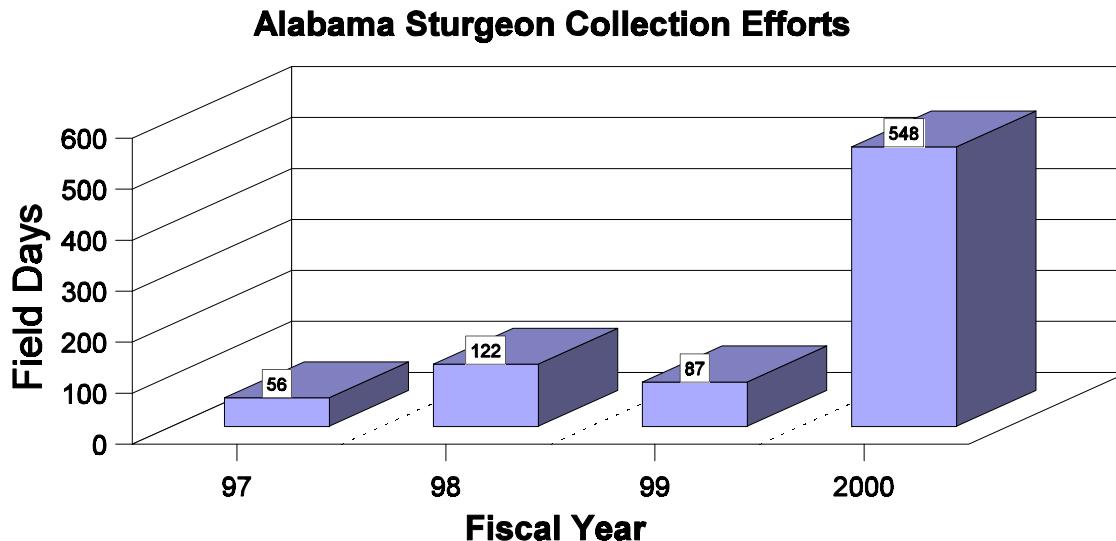
ACCOMPLISHMENTS TO DATE: None to report.

[NOTE: THE BALANCE OF THIS PAGE WAS LEFT BLANK INTENTIONALLY]

ACTION PLAN

BROODSTOCK COLLECTION

- 1) Conduct annual collection efforts in the lower Alabama River. The greatest historical collection success has occurred during late winter and early spring seasons. Annual collection efforts will be concentrated during this time.
 - Since broodstock collections were initiated in March 1997 as part of the voluntary conservation plan, collection efforts have incorporated a great deal of discussion time in assessing every aspect of collection work as it relates to bait, habitat preference, gear, feeding time, atmospheric pressure, rain, water flow, water temperature, etc.. This self-evaluation is important and valuable to the eventual success of the Action Plan and will continue to be an important component of the broodstock collection effort.
 - Since 1997, over 250 field days (field day = 1 collection team consisting of two biologists) have been devoted to broodstock collection efforts. Beginning in 2000, 548 field days will be expended each year for a three year period. The parties to this Agreement may decide to reallocate some of the funds for this broodstock collection effort to other activities under this Strategy and Action Plan if the collection effort is successful in the first two years of implementation.



- 2) Collection efforts will be focused on the spawning season (March-May), and to a lesser extent during cooler months when fish survival is greater (September-November). Some effort will be expended during high water months (January-February) and warm summer months (June-August) when capture is less likely due to environmental conditions and poor historical collection success (see Field Day Schedule, below).

FIELD DAY SCHEDULE

MONTH	ADCNR-1	ADCNR-2	Corps/ WES-1	Corps/ WES-2	Service	TOTAL
OCTOBER	8	8	20	16	16	68
NOVEMBER	12	12	20	12	12	68
DECEMBER	8	8	8	8	8	40
JANUARY	6	6	0	0	0	12
FEBRUARY	6	6	0	0	0	12
MARCH	16	16	20	16	16	84
APRIL	16	16	20	16	16	84
MAY	16	16	20	16	16	84
JUNE	6	6	0	0	0	12
JULY	6	6	0	0	0	12
AUGUST	6	6	0	0	0	12
SEPTEMBER	6	6	16	16	16	60
TOTAL	112	112	124	100	100	548

- Minimal collection effort through 2003 will include ADCNR (2 crews), Corps/WES (2 crews), and the Service (1 crew), according to the Field Day Schedule, above. Each crew will consist of an individual experienced in sturgeon collection techniques and gear and an assistant. Additional crews may be employed, as available.
- Fishing efforts will be concentrated in riverine areas of highest historical capture success. These areas occur between Alabama River miles 20-133.
- Fishing efforts will be coordinated by the ADCNR Fisheries Division.
- An interagency team will evaluate pallid sturgeon broodstock collection efforts by the Louisiana Department of Wildlife and Fisheries below the Old River Control Structure at the origin of the Atchafalaya River, including flow manipulation to attract spawning sturgeon, in order to determine their applicability to sturgeon collection efforts in the lower Alabama River.
- The Corps will investigate the potential to attract sturgeon to Claiborne Lock by manipulating flows and modifying lock operations. A series of tests will be conducted prior to and during the spawning season to determine if spawning sturgeon can be attracted to the Lock. The collection methodology will be designed by ADCNR, the Service, and the Corps.
- A new ADCNR Fisheries position will be assigned to provide support for Alabama sturgeon collection and propagation work at Marion State Fish Hatchery.
- Collection crews will take water temperatures from all sample areas during the spring and summer seasons.
- The Corps will participate with ADCNR to enable reasonable usage of primary boat ramps used by collection crews for easy access to the Alabama River.
- When available, private party expertise from outside Alabama will be utilized to assist ADCNR, Service and Corps/WES collection teams in an effort to increase capture success.

- A contractual bonus system will be developed to involve selected teams of commercial fishermen to assist ADCNR in the collection effort to increase capture success.

HATCHERY PROGRAM

- 1) Complete hatchery modifications for sturgeon culture.
 - Assemble and install 20 ft tanks for sturgeon holding.
 - Fence sturgeon shed and install security system.
- 2) Complete propagation, culture, and fingerling protocols.
- 3) Sex and propagate newly captured broodstock fish, as appropriate.
- 4) Develop less invasive techniques for determining sex and reproductive condition of sturgeon broodstock.
- 5) Develop reliable techniques for determining the age and growth of sturgeon using known age, hatchery reared fish.
- 6) Develop and implement a genetic conservation plan for Alabama sturgeon broodstock to ensure that existing genetic variability will be identified and maintained by maximizing outcrossing.
 - Take and preserve genetic samples from all captured sturgeon for use in future genetic work.
- 7) Cryopreserve sperm from captive male sturgeon.
 - Collect and cryopreserve sperm from captured males during Spring of 2000.
- 8) Conduct feeding and growth studies on broodstock and their progeny when propagation is successful. Determine diet, growth rates, etc..
 - Investigate nutritional needs of captive broodstock with respect to enhancing fecundity and reducing reproductive cycle intervals.
 - Investigate potential diets and feeding regimes for the production of fingerlings.
- 9) Assemble and incorporate information on sturgeon rearing developed by other river sturgeon hatchery programs.
- 10) Investigate the potential impact of larval or fingerling imprinting on augmentation strategies.

HABITAT PROTECTION AND IMPROVEMENTS

- 1) Identify and protect existing channel habitat conditions in the lower Alabama River.

- Use existing Federal/State coordination and permit review process to identify and protect existing nine foot channel integrity and flow in the Alabama River and its tributaries.
 - Pursue implementation of aquatic ecosystem restoration projects through State/Federal collaboration, including cost sharing Section 1135/206 projects and other applicable authorities.
 - Identify, test, and pursue implementation methods and practices to facilitate fish passage through, over, or around Claiborne Lock and Dam.
 - Identify, delineate, protect, and monitor stable riverine habitats (including mussel beds) in the lower Alabama River.
 - Identify and avoid or minimize impacts to stable riverine occupied habitat from navigation dredging activities.
- 2) Maintain existing flow conditions in the lower Alabama River and its tributaries.
- Maintain existing 3200 cubic feet per second (“cfs”) minimum flows into the upper Alabama River.
 - Describe and maintain existing flow regimes at Claiborne, Millers Ferry and Jones Bluff Locks and Dams.
- 3) Maintain existing Fish and Wildlife water quality use classification in the lower Alabama River.
- Assess existing State regulatory agency data and monitoring program for the lower Alabama River. In order to better ensure and document compliance with current State water quality standards, a minimum of 8 water quality sample stations will be established in the lower Alabama River, including 4 stations in the Millers Ferry Pool, 2 in the Claiborne Pool, and 2 in the Alabama River below Claiborne Lock and Dam. Samples (2/month, April-October, 4/month in August) will be taken annually for a 5-year period beginning April 2000.
 - Ensure that all Federal and State construction activities that might affect the lower Alabama River or its tributaries effectively implement best management practices for stormwater runoff and sediment control.
 - Use hatchery reared sturgeon, if and when available, for toxicity studies.

HABITAT STUDIES

- 1) Complete GIS database of lower Alabama River channel features from Millers Ferry Lock and Dam south to the Tombigbee River confluence, including bathymetry, current velocity, substrate, temperature, and other water quality parameters.
- Develop a digital map program including features of the lower Alabama River.
- 2) Complete dive survey of habitat features in the lower Alabama River.
- 3) Use Alabama sturgeon captures not needed for broodstock purposes, and/or hatchery reared Alabama sturgeon, for telemetry studies to determine the sturgeons’ seasonal habitat usage and movements.

- 4) Identify and pursue sediment studies in the lower Alabama River, including identifying sediment sources and annual sediment movement associated with tributaries and the main channel.
- 5) Identify and prioritize recovery potential within currently occupied habitat in the lower Alabama River.

LIFE HISTORY STUDIES

- 1) Complete prey density studies in the lower Alabama River to identify important sturgeon feeding areas.
- 2) Assemble information on larval and post-larval times for pallid and shovelnose sturgeon. Use this information in conjunction with flow data from various portions of the lower Alabama River to develop models showing potential drift development distances.
- 3) Conduct larval and young-of-year sturgeon surveys in the lower Alabama River to identify breeding and juvenile sturgeon habitats.
- 4) Identify and delineate larval and juvenile sturgeon habitats in the lower Alabama River.
- 5) Use sturgeon captures not needed for broodstock purposes for mark/recapture studies to estimate population size, demographics, and seasonal movements.
- 6) Use hatchery reared sturgeon for basic life history and habitat preference studies and to determine potential of habitat imprinting on juvenile sturgeon.
- 7) Initiate and organize a river sturgeon workshop to share information on collection, propagation, re-introduction, and management of *Scaphirhynchus* species, possibly in association with the Paddlefish/Sturgeon Symposium scheduled for 2001.

AUGMENT/REESTABLISH STURGEON POPULATIONS IN THE LOWER ALABAMA RIVER

- 1) Develop a population augmentation plan that includes optimal stocking size, stocking densities, season, locations, tagging methods, and transport and release methods.
- 2) Develop restocking criteria and plans for currently occupied riverine reaches of the lower Alabama River.
- 3) Develop a monitoring plan that includes survival, health, and movement of released hatchery reared fish.
- 4) Coordinate sturgeon stocking plans with all interested parties.

IMPLEMENTATION SCHEDULE

- 1) Firm commitments from Federal, State, and private parties to secure funding to implement this action plan by Spring 2000.
- 2) Firm commitments to identify and protect existing occupied habitat conditions by Spring 2000.
- 3) Increased collection efforts initiated by Spring 2000.
- 4) Initiate habitat and life history studies by Fall 2000.
- 5) Collect and maintain an average of 3 male and 3 female Alabama sturgeon per year in the Marion State Fish Hatchery for propagation purposes for the life of the plan.
- 6) Successfully spawn captive broodfish by 2003.
- 7) Begin population augmentation (fingerling releases) by 2004.
- 8) Hold an annual meeting in February of each year of involved partners to assess and plan collection and hatchery efforts, habitat protection and improvements, and research priorities.
- 9) Review and renew the commitments of the involved parties for the remaining five-year term of this plan in February of 2004.

IMPLEMENTATION RESPONSIBILITIES

Broodstock Collection

ADCNR

Provide two crews and equipment for 224 field day collection effort/year; coordinate all collection efforts.

Corps/WES

Provide two crews and equipment for 224 field day collection effort/year; work with ADCNR to identify possibilities of manipulating flows below Claiborne Lock for collection efforts.

Service

Provide support funding to ADCNR and one crew and equipment for 100 field day collection effort/year.

Rivers Coalition

Assist all parties with the funding for their collection efforts.

Hatchery Program

ADCNR

Provide hatchery facilities, equipment, and personnel for hatchery efforts; develop and revise (as necessary) propagation, culture and fingerling protocols and strategies; develop and implement genetic conservation plan; conduct and coordinate propagation activities and other hatchery-related research.

Service

Provide funding, personnel and technical assistance to State.

Rivers Coalition

Assist all parties with funding for the hatchery program.

Habitat Protection and Improvements

State, Service, Corps

Use applicable regulatory responsibilities to maintain habitat and water quality integrity in the lower Alabama River; cooperate in habitat studies and research, and collaborate in pursuing and implementing aquatic ecosystem restoration projects and strategies.

State, Rivers Coalition

Establish water quality sample stations, as identified in the Action Plan, and conduct annual sampling program; use authority to correct problems, if any, identified through the program.

Other State Programs

Require appropriate implementation of BMPs for construction activities conducted or authorized by the State.

Corps

Coordinate fish passage studies; avoid or minimize impacts related to navigation dredging; describe and maintain existing flow regimes below Jones Bluff, Millers Ferry, and Claiborne Locks and Dams; require appropriate implementation of BMPs for construction activities conducted or authorized by the Corps; continue to conduct and coordinate riverine habitat studies related to the existing navigation channel.

Rivers Coalition

Participate in development and review of habitat protection efforts, and ensure through the actions of its members that present conditions in the currently occupied habitat are maintained.

Habitat Studies

Corps

Develop bathymetric information below Millers Ferry Lock and Dam.

State

Develop initial turbidity and sediment data at water sampling stations.

Service, ADCNR

Conduct and collaborate in telemetry studies as appropriate.

All Parties

Review and assess habitat research design and results.

Life History Studies

Service

Complete prey density studies; assemble data on sturgeon life stages; model flows and larval and post-larval development periods; identify potential larval and juvenile habitats.

ADCNR, Service, and appropriate research partners

Collaborate on demographic and movement studies as opportunities are presented.

All Parties

Review and assess life history research design and results; initiate and organize a river sturgeon workshop.

Augment/Reestablish Sturgeon Populations

ADCNR

Develop augmentation plan.

All Parties

Review and assess augmentation planning and criteria; provide assistance as appropriate.

Coordinate Activities and Revise Action Plan As Appropriate

All Parties

Participate in an annual meeting to review efforts and information, identify funding needs and sources, and modify Strategy and Action Plan activities, as necessary.

FUNDING REQUIREMENTS (000's)

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
Broodstock Collection	592	592	592	295	295
Hatchery Program	150	150	150	150	150
Habitat Actions	60	60	60	60	60
Habitat Research	100	25	25	25	25
Life History Research	50	50	50	75	75
Stocking	NA	NA	NA	25	25
Monitoring	(Costs included in the broodstock collection program through FY 2004).				
TOTAL	952	877	877	630	630

FUNDING COMMITMENTS (000's)

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
* Service	150	150	150	150	150
* ADCNR	250	250	250	250	250
**Corps/WES	300	200	200	200	200
State of Alabama	126	138	139	15	15
Rivers Coalition	126	139	138	15	15
 TOTAL	 952	 877	 877	 630	 630

* From federal funding to be continued at the present level of \$400,000 per year

** Additional \$100,000 in year 2000 for habitat studies

The funding needs and commitments outlined above address the parties' view of the broodstock collection, hatchery program, habitat actions, habitat research, life history research, stocking, and monitoring programs through 2004. However, if the parties through the use of adaptive management determine that additional programs are required to accomplish the goals and objectives of this Strategy, they agree they will make their best efforts to secure additional funding for these programs.

INVOLVED PARTIES AND RESPONSIBILITIES

State of Alabama (ADCNR, Governors Office)

Responsibilities: Provide funds, personnel, facilities, and equipment for collections, hatchery, water quality sampling, and supervision and assistance as required to implement the Strategy and Action Plan. Ensure appropriate consideration and implementation of State regulations applying to protection of sturgeon and habitat. Consider the sturgeon and its habitat in permit review and other state regulatory processes.

U.S. Fish and Wildlife Service

Responsibilities: Provide funds, personnel, equipment, and assistance as needed to implement the Strategy and Action Plan. Consider the sturgeon and its habitat in the federal permit review and Fish and Wildlife Coordination process.

U.S. Army Corps of Engineers (Mobile District, Waterway Experiment Station)

Responsibilities: Provide funds, personnel, equipment, and assistance as needed to implement the Strategy and Action Plan. Consider the sturgeon and its habitat in planning and conducting navigation maintenance dredging actions, federal permit process, etc., and coordinate actions and research with the State and the Service.

Alabama-Tombigbee Rivers Coalition

Responsibilities: Provide funds, expertise and assistance as needed to implement the Strategy and Action Plan.

LITERATURE CITED

[Information to be supplied by FWS personnel]